PEACE/WILLISTON
FISH & WILDLIFE
COMPENSATION
PROGRAM

BC hydro

BRITISH
COLUMBIA

A Reconnaissance Survey Of Finger Lake

D. A. Jesson
1990

PWFWCP Report No. 100

The Peace/Williston Fish & Wildlife Compensation Program is a cooperative venture of BC Hydro and the provincial fish and wildlife management agencies, supported by funding from BC Hydro. The Program was established to enhance and protect fish and wildlife resources affected by the construction of the W.A.C. Bennett and Peace Canyon dams on the Peace River, and the subsequent creation of the Williston and Dinosaur Reservoirs.

Peace/Williston Fish and Wildlife Compensation Program, 1011 Fourth Ave. 3rd Floor, Prince George B.C. V2L 3H9

Website: *www.bchydro.bc.ca/environment/initiatives/pwcp/*

This report has been approved by the Peace/Williston Fish and Wildlife Compensation Program Fish Technical Committee.

Citation: D. A. Jesson. 1990. A reconnaissance survey of Finger Lake. Peace/Williston Fish and Wildlife Compensation Program. Report No. 100. 22pp plus appendices.

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105-02922/

A RECONNAISSANCE SURVEY OF

FINGER LAKE

WATERSHED: PARSNIP RIVER

DATE OF SURVEY: JUNE 13 and 14. 1990

FIELD CREW LEADER: D. A. JESSON

FIELD ASSISTANT: A. R. MCLEAN

REPORT PREPARED BY: D. A. JESSON

WILLISTON FISHERIES PROJECT

B. C. HYDRO

ENVIRONMENTAL RESOURCES

and

MINISTRY OF ENVIRONMENT

RECREATIONAL FISHERIES BRANCH

RELEASED BY: _____

D.H.G. Ableson, Regional Fisheries Biologist

LAKE: **FINGER** **SYSTEM NAME: UNNAMED C.**

A.S.A.P. REFERENCE NO.: **SYSTEM NO: 25-0400-110-***-***

DATA ON FILE FOR THIS SURVEY

Location	X	Dissolved O2/Temp. Profiles	X
Physical Data	X	Winter Dissolved 02/Temp. Profiles	
Bench Mark	X	Netting Record	X
Terrain Features	X	Lake Catch Summary	X
Access	X	Individual Fish Data	X
Resorts and Campsites	X	Fish Preserved	
Other Developments	X	Stomach Analysis	X
Obstructions and Pollutions	X	Scale Reading	X
Special Restrictions	X	Location of Inventory Sites	X
Aquatic Plants	X	Photograph Directory	X
Wildlife Observations	X	Appendices:	
Miscellaneous Comments	X	A: Water Chemistry Analysis	X
Lake Drainage	X	B: Tributary Stream Data	X
Fisheries Management Comments	X	Bathymetric Map Reduction	X
History of Previous Surveys	X	Bathymetric Map	X
Water Chemistry Summary	X		

LOCATION

Location:	51.5 km W of Mackenzie		
Elevation:	1055 m +/-		
Latitude/Longitude:	55°19'52":123°55'34"	U.T.M.:	10.4413.61318
Management Unit:	7-28	N.T.S. Map No.:	93-0/5

Drainage: Outlet C. --> Unnamed C. (outlet of Munro L.)--> Nation R. --> Williston L. (Parsnip Reach)--> Peace R.

PHYSICAL DATA

Lake Drainage Area:		Volume:	5,300,000 m^3
Water Surface Area:	905,000 m^2	Flushing Rate:	
Area above 6 m contour:	422,000 m^2	Perimeter of Islands:	
Shoreline Perimeter:	6,840 m	Number of Islands:	0
Maximum Depth:	12.0m	Mean Depth:	5.9 m
Filterable Residue (TDS):	70 mg/l	Secchi Reading:	2.15m

Sounding Device: Lowrance X-15 Elevation Source: Contour interpolation

BENCHMARK

(Iron spike, center of red circle) located 2 m above present water level in a 40 cm diameter spruce tree. The tree is located 3 m from the present water's edge and to the right of the access trail, as you approach the lake.

High water mark: 0 m above water level at time of survey.
(Lake appears to be at maximum level.)

Lake: **FINGER**

TERRAIN FEATURES

Immediate Shoreline:

The shoreline is low to moderately steep around the entire lake except for two small marsh areas at the northwest and southeast (outlet) ends. The lake is treed to the water's edge except for logged areas along the north and southeast shores. A fringe of alder fronts the shoreline. Some areas have sedge grass extending 1 to 2 metres into the water. The lake bottom drops off quickly from shore, especially along the north shore. Some shallows exist in the bays and one shoal is present near the outlet. Boating access to the shoreline is best in the bays; however, deadfall along the entire shoreline makes boating near shore difficult. Shoreline access from land is good along the south shore with trails leading from the 10 000 Road. Shoreline substrate consists mainly of cobbles, gravel and some boulder with an overlying layer of silt. The outlet end has a predominantly organic/silt shoreline.

Surrounding Country:

The surrounding country is characterized by gently rolling hills. Except for logged areas to the north and southeast, forest cover is complete and dense consisting of mature first growth coniferous species (spruce, balsam fir and the occasional Lodgepole pine). No deciduous species were present except shoreline alder.

Finger Lake is situated within the sub-boreal spruce bio-geoclimatic zone.

Lake: **FINGER**

ACCESS

Directions:

From the corner of Mackenzie Boulevard and Centennial Drive in downtown Mackenzie, travel south 29.3 km on Highway 39. Turn right and travel south 3.1 km on Highway 97. Turn right onto the Finlay Forest Service Road and travel north 63.9 km. Take the left fork onto the Finlay-Nation Forest Service Road. At 24.8 km the road forks (keep right). At 45.4 km turn left onto the 10 000 Road and remain on the main road (numerous forks). At 6.0 km the lake is visible on the left hand side. A 40 m trail leads to the lake. The total distance by road from Mackenzie to Finger Lake is 147.7 km.

Road Type and Conditions:

Highways 39 and 97 are paved, two lane roads in good condition.
Finlay Forest Service Road is a fair to good, 2 lane, main haul gravel logging road with some muddy/rough sections.
Finlay-Nation Forest Service Road is a good, 2 lane, main haul gravel logging road.
10 000 Road is a good, one lane gravel road. A minor washout was negotiable by 2-wheel drive vehicle.

Restrictions:

None noted.

RESORTS AND CAMPSITES

A cleared undeveloped campsite is located along the SW shore of the lake, off the 10 000 Road.

OTHER DEVELOPMENTS

No other developments were noted.

Lake: **FINGER**

OBSTRUCTIONS AND POLLUTIONS

A beaver dam on the outlet (60 m in length and 0.5 m in height) may be an obstruction to fish moving upstream.

SPECIAL RESTRICTIONS

No special restrictions were noted.

AQUATIC PLANTS

Aquatic plants are sparse and occur primarily near shore and in the shallows of bays. A greater abundance of plant life is expected later on in summer. The following species were identified in the field. None were collected.

Equisetum fluviatile Sedge grass
Chara sp.

WILDLIFE OBSERVATIONS

Several ducks and one beaver were observed.

MISCELLANEOUS COMMENTS

Numerous rainbow trout were observed rising and jumping.
Mackenzie Forest Recreation Officer, Jim Ladds, has expressed an interest in developing a recreation site on Finger Lake.

Bathymetric map: The late outline is from an enlargement of aerial photograph BC 7273 No. 205, flown August 1, 1990.

Lake: **FINGER**

LAKEDRAINAGE

General:

Finger Lake has numerous intermittent inlets (7) and one outlet.
Flow was present in the intermittent inlets due to recent rain. The outlet flows south and then west a total of 7.5 km to its confluence with an unnamed C. (outlet of Munro Lake). The unnamed C. flows SE 15 km to its confluence with the Nation R.

Major Systems:

There are no major systems.

Minor Systems:

Unnamed C. - outlet

The outlet drains the lake at the SE end. The outlet is blocked by a beaver dam (60 m in length and 0.5 m in height) approximately 150 m downstream from the lake. The dam is overgrown with flow over the top. It does not appear to be actively maintained. No salmonid spawning habitat is present upstream or downstream of the dam. At 50 m downstream of the beaver dam, the outlet has a velocity of 0.3 m/sec and a water temperature of 13.5°C. The average wetted width is 1.8 m, the average depth 40 cm and the bed material is 100% organics. At this point the outlet meanders through an organic marsh with no fisheries enhancement potential. There is no salmonid spawning habitat and only marginal rearing habitat present. Aerial photography indicates the outlet is swamp until at least 2 km downstream of the lake.
A tributary stream to the outlet may provide spawning, but was not investigated due to difficult access. The netting of spent rainbow trout adults indicates spawning is taking place.
Refer to the stream data sheet for additional outlet information.

Intermittent Inlets # 1-7

Flow into Finger Lake consists of a number of intermittent inlets with no fisheries potential. A total of 7 intermittent inlets were identified. The majority occur along the SW shore of the lake, entering the numerous bays along the shore.
The inlets flow through organics and drain low-lying areas adjacent to the lake.

Lake: **FINGER**

FISHERIES MANAGEMENT COMMENTS

The condition of the rainbow trout indicates they are doing very well. Providing the present food base remains stable, the rainbow should continue to do well. Stock assessment is recommended in 3 to 5 years in order to monitor the rainbow population as more anglers are expected to fish the lake. If rainbow stocks decline due to increased fishing pressure, native stocks can be supplemented with an occasional stocking.

Any future fisheries initiatives should concentrate on the identification of the location and amount of available spawning habitat. This is especially necessary if it is deemed desirable to maintain the genetic integrity of the wild rainbow population, given a substantial increase in angling pressure.

HISTORY OF PREVIOUS SURVEYS

Lake Surveys:

None known.

Other Related Surveys:

None known.

Lake: **FINGER**

WATER CHEMISTRY SUMMARY **Limnology Station No. 1**

Field Conditions:

Date:	June 13, 1990		
Time:	1530 hrs	Air Temperature:	17°C
Wind Velocity:	15-20 km/hr	Wind Direction:	south
Cloud Cover:	6/10o.c.	Surface Condition:	slight chop
Secchi Disc:	2.15 m	Water Colour:	slightly tannic

Method(s) Used:

Dissolved Oxygen:	YSI model 58 oxygen/temperature meter
Water Temperature:	YSI model 58 oxygen/temperature meter
Air Temperature:	Hand-held alcohol thermometer
ph (field):	Digital ph pocket tester
H2S (field):	Hach H2S field test kit
Laboratory Used:	Zenon Environmental Inc. B.C. Laboratory Services
Water Sampler:	Verticle Alpha Water Bottle (Vandorn)
Substrate Sampler:	Substrate sample not taken

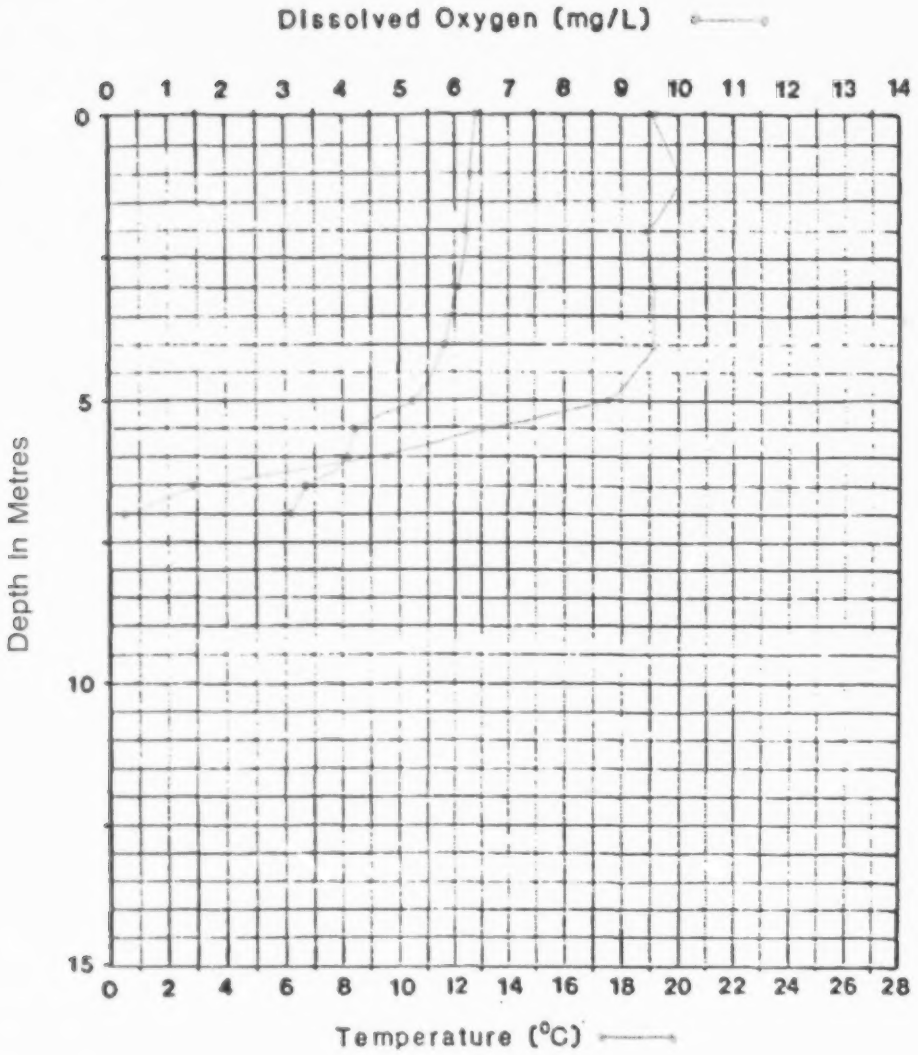
Water Sample Chemistry: SEAM Site No.: Not determined

	Sampling Depths	
	Surface (O m)	Lower (9.5 m)
Ph (field)	8.3	7.5
pH (lab)	7.7	7.1
Specific Conductance (lab)	67 umhos/cm	78 umhos/cm
Filterable Residue 105°C (lab)	70 mg/l	72 mg/l
H2S (field)	- mg/l	0.0 mg/l

Bottom Depth:	10.5 m
Substrate Sample Depth:	- m

NOTE:
Water sample too long in transit to guarantee the accuracy of ph(lab) results.

DISSOLVED OXYGEN AND **TEMPERATURE** PROFILE



Lake: **FINGER**

DATE: June 13, 1990

SUMMER OXYGEN/TEMPERATURE DATA

Depth (m)	02 (mg/l)	Temp (°C)
surface	9.6	12.9
1.0	10.0	12.7
2.0	9.4	12.4
3.0	9.6	12.1
4.0	9.6	11.6
5.0	8.8	10.5
5.5	6.5	8.4
6.0	4.8	8.1
6.5	1.4	6.8
7.0	0.3	6.2
10.5	Bottom	

COMMENTS:

Windy conditions have allowed for good mixing of upper water layers.

Lake: **FINGER**

NETTING RECORD

Mesh sizes experimental order: 25, 76, 51, 89, 38, 64 mm

NETTING SITE #1

Type:	Sinking monofilament		
Date Set:	June 13, 1990	Time:	1800 hrs
Date Lifted:	June 14, 1990	Time:	1130 hrs
Net Dimensions:	Length: 91.4 m	Depth:	2.4 m
Shallow End Mesh Size:	25 mm	Depth:	2.0 m
		Substrate:	silt over cobble, gravel
Deep End Mesh Size:	64 mm	Depth:	7.5 m
		Substrate:	organics

Comments:

Two rainbow trout escaped from net.

Lake: **FINGER**

LAKE CATCH SUMMARY

SPECIES	NET SITE NO.				ANGLED	OTHER	TOTAL	NUMBER SAMPLED	NUMBER PRESERVED	SIZE RANGE (cm)
	1	2	3	4						
Rainbow trout	31				-	-	31	31	-	11.5 - 37.0
Peamouth chub	91				-	-	91	-	-	average 10.8 cm

Comments:

Minnow Traps:

BAIT: Sardines

#	HOURS	DEPTH (m)	SUBSTRATE	SPECIES	SIZE RANGE (cm)
1	19.5	0.5	cobble/ organics	78 peamouth chub 1 leech	5.8 - 11.6
2	19.0	0.3	organics	10 peamouth chub	average 9.5
3					

Comments:

Lake: **FINGER**

INDIVIDUAL FISH DATA

Date Captured: JUNE 13. 14. 1990

Method of Capture: Sinking monofilament gillnet

M -Male
F -Female
? -Not Obvious

IMM - Immature
MG -Maturing
MT -Mature
GV -Gravid
SP -Spent
? -Not Obvious

BG -Egg
FR -Fin Ray
HD -Head
ML -Milt
OT -Otolith

SC -Scale
ST -Stomach
TG -Fish Tag
WF -Whole Fish

Species	Fork Length (cm)	Weight (g)	Sex	Gonadal maturity	Sample Type	Age (yr)	Plankton	Stomach Contents Insects	Fish	Other	Comments
Rainbow	11.5	25	?	IMM	SC	3+					
Rainbow	17.2	60	F	MG		2+		beetles, flying ins.			tapeworms
Rainbow	21.0	119	M	MG							No scale sample taken.
Rainbow	21.2	140	?	IMM	SC	2+		beetles, flying ins.			tapeworms
Rainbow	21.5	145	F	IMM	SC	3+					
Rainbow	21.5	130	?	IMM	SC	2+					
Rainbow	25.0	180	?	IMM	SC	3+		flying insects			tapeworms nodules
Rainbow	26.4	250	M	MG	SC	3+		beetles, flying ins.			
Rainbow	26.5	210	M	MG							No scale sample taken.
Rainbow	26.6	250	F	MG	SC	3+	Gammarus sp.	flying insects			
Rainbow	27.1	240	M	MG	SC	3+	Zooplankton?			detritus	
Rainbow	29.2	260	M	SP	SC	7		beetles			dark colouration; regenerated scales
Rainbow	30.0	330	F	MG	SC	4+		beetles		mush	tapeworm nodules, tapeworm in stomach
Rainbow	30.5	280	F	MG	SC	4+		flying insects, beetles			tapeworm adults & nodules; will spawn next year.
Rainbow	31.0	350	M	MG	SC	4		full of beetles, flying ins.			silver colouration; resorbed scales
Rainbow	31.0	350	M	MG	SC	7		beetles			tapeworms; regenerated scales
Rainbow	32.9	410	F	MG	SC	4+		beetles, flying insect			silver colouration; will spawn next year; tapeworms
Rainbow	33.0	400	M	MG	SC	3+	Gammarus sp.	beetles, flying ins.		detritus	tapeworm cysts
Rainbow	33.6	430	M	MG	SC	3+		beetles, flying ins.			silver colouration, will spawn next yr. resorbed scales
Rainbow	33.8	450	M	MG	SC	3+					
Rainbow	34.0	520	F	SP	SC	4+	Gammarus sp.				

Lake: **FINGER**

INDIVIDUAL FISH DATA

Date Captured: JUNE 13. 14. 1990

Method of Capture: Sinking monofilament gillnet

M -Male
F -Female
?-Not Obvious

IMM - Immature
MG -Maturing
MT -Mature
GV -Gravid
SP -Spent
? -Not Obvious

EG -Egg
FR -Fin Ray
HD -Head
ML -Milt
OT -Otolith

SC -Scale
ST -Stomach
TG -Fish Tag
WF -Whole Fish

Species	Fork Length (cm)	Weight (g)	Sex	Gonadal maturity	Sample Type	Age (yr)	Stomach Contents: Plankton	Insects	Fish	Other	Comments
Rainbow	34.3	460	F	SP	SC	5	full of fresh water shrimp	full of beetles			Tapeworm cysts on gut; resorbed scales
Rainbow	35.0	420	F	SP	SC	3+		flying ins, beetles, chironomids			Tapeworm cysts and adults
Rainbow	35.3	440	M	SP	SC	?					Dark colouration; tapeworm cysts and nodules; stomach empty; resorbed sc.
Rainbow	35.6	540	f	MG	SC	4		flying insects			Silver colouration will spawn next yr
Rainbow	36.0	440	F	SP	SC	5		flying insects		detritus	Tapeworms in gut; resorbed scales
Rainbow	36.4	550	M	MG	SC	5		flying insects			Nice fish;tapeworm cysts & nodules; adult tapeworms; resorbed scales
Rainbow	36.4	460	F	SP	SC	5		stomach full of beetles		detritus	resorbed scales
Rainbow	37.0	560	M	MG	SC	5		beetles, flying ins.			Silver colouration will spawn next yr

Age determination completed under contract by:

Margaret McDonald
Box 243
Midway, B.C.
VOH 1MO

Lake: **FINGER**

PHOTOGRAPHDIRECTORY

Negative #	Plate #	Description
R3:19,20,21	1	Panoramic view of Finger Lake shoreline looking east and southeast from the limno station.
R3:14,15,16	2	Panoramic view of Finger Lake shoreline looking west and northwest from the outlet (SE) end of lake.
R3:17,18	3	Panoramic view of the north shore of Finger Lake at an area logged to the water's edge.
R3:9	4	View of outlet looking downstream from lake.
R3:11	5	View upstream from beaver dam on outlet, located approximately 150 m downstream from lake.
R3:10	6	View downstream from beaver dam on outlet, located approximately 150 m downstream from the lake.
R3:12	7	View upstream from sample site #1 on outlet. Site is located approximately 200 m downstream from lake (50 m downstream from beaver dam).
R3:8	8	View downstream of typical intermittent inlet entering SW shore of Finger Lake. All the intermittent inlets have no fisheries potential.

Lake: FINGER

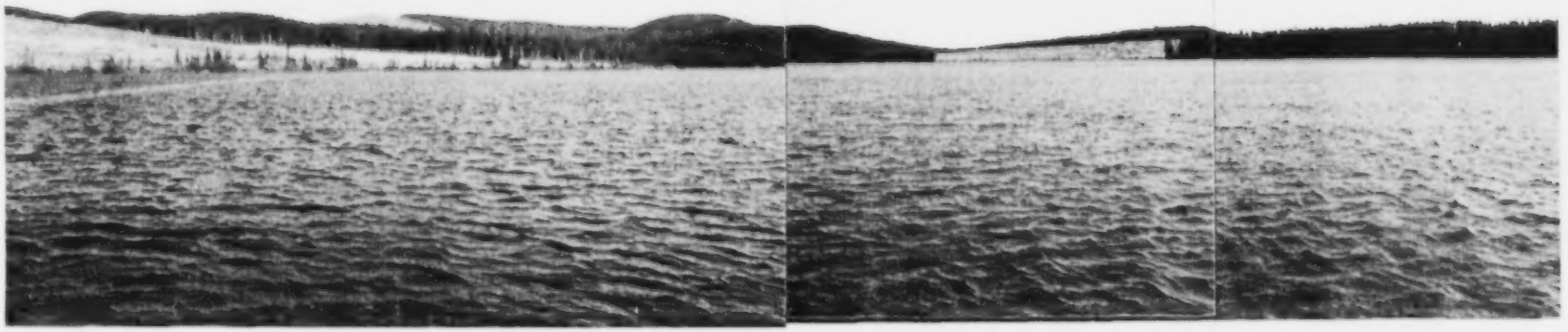


Plate 1: Panoramic view of Finger Lake shoreline looking east and southeast from the limno station.

Lake: FINGER

Plate 2: Panoramic view of Finger Lake shoreline looking west and northwest from the outlet (SE) end of lake.

Lake: **FINGER**

Plate 3: Panoramic view of the north shore of Finger Lake at an area logged to the water's edge.

Lake: **FINGER**

Plate 4: View of outlet looking downstream from lake.

Plate 5: View upstream from beaver dam on outlet, located approximately 150 m downstream from lake.

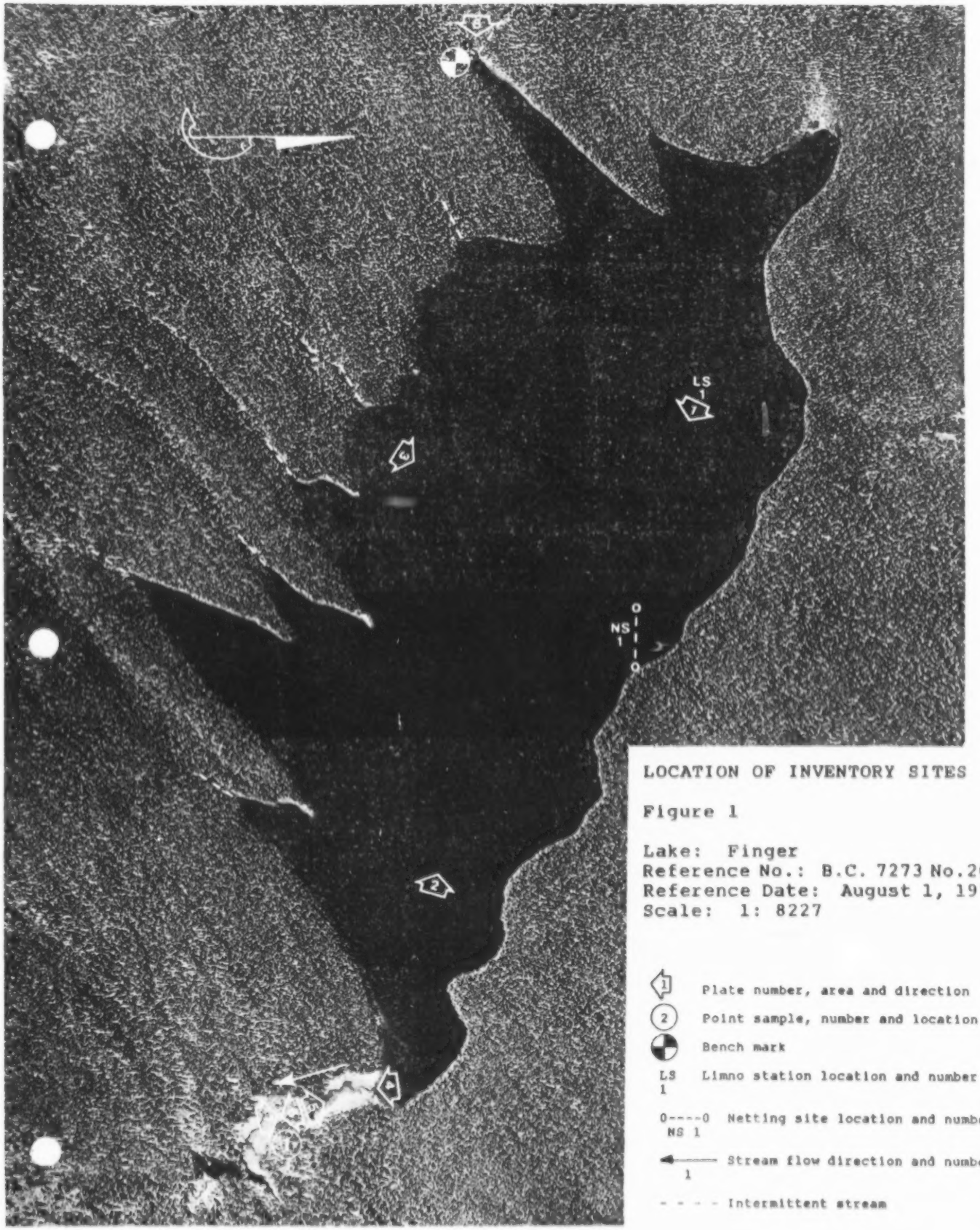
Lake: **FINGER**

Plate 6: View downstream from beaver dam on outlet located approximately 150 m downstream from lake.

Lake: **FINGER**

Plate 7:
View upstream from sample site #1, on outlet. Site is located approximately 200 m downstream from lake (50 m downstream from beaver dam).

Plate 8:
View downstream of typical intermittent inlet entering SW shore of Finger Lake. All the intermittent inlets have no fisheries potential.



LOCATION OF INVENTORY SITES

Figure 1

Lake: Finger
Reference No.: B.C. 7273 No.205
Reference Date: August 1, 1970
Scale: 1: 8227

1 Plate number, area and direction

2 Point sample, number and location

Bench mark

LS 1 Limno station location and number

0----0 NS 1 Netting site location and number

1 Stream flow direction and number

- - - - Intermittent stream

Lake: FINGER

Appendix A

LABORATORY REPORT

Water Chemistry Analysis

B.C. LABORATORY SERVICES
Report for form 03000112

FISH - PRINCE GEORGE ATTN: DUANE JESSON

Site: NOSITE FINGER LAKE

Submitted by (86217) WESTCOTT R G

Address (07) Waste Management Branch
Northern Region
3rd Floor, 1011 4th Avenue
Prince George, BC V2L 3H9

Phone No 565-6944

Audit Sample ( )
Client study reference code ( )
Sampling agency code (9i)

Site (NOSITE) FINGER LAKE

Sample Adjective ( )
Sample State (FW) Fresh Water
Sample Descriptor ( ) Undefined

This form was processed to the computer on 18-JUN-1990 as REGULAR
The cost for analyzing samples for this form is

Routine analysis:	$	115.90
Special analysis:	$	0.00
Total	$	115.90

B.C. MINISTRY OF ENVIRONMENT
JUN 28 1990
RECEIVED
PRINCE GEORGE, B.C.

Site: NOSITE FINGER LAKE

From : 90/06/14 0001 To : 90/06/14 0001
Depth Range : 0.0 0.0 Tide :
Sample State: Fresh Water
Sample Comment

Parameter Description	Result	Units	Analytical Technique (Sparcode/Medium/Pres'n)
pH	?	pH units	Automated pH Meter (00041220/02/01)
Result 7.7, pH units. Analyzed outside of optimal time frame.			
Residue Nonfilt	4	mg/L	Grav, 9 cm Buchner, 105C (00081070/02/01)
Specific Conductance	67	uS/cm	Cond Meter Siebold (00111160/02/01)
Res. Filterable 1.0u	70	mg/L	Gravimetric 1.0u Filter (007H1032/02/01)
Alkalinity Total 4.5	?	mg/L	Automated Electrometer (01021210/02/01)
Result 35.2, mg/L. Analyzed outside of optimal time frame.			

Site: NOSITE FINGER LAKE

From :90/06/14:0002 To :90/06/14:0002
Depth Range : ~~0.0~~ ~~0.0~~ 9.5m Tide :
Sample State: Fresh Water
Sample Comment:

Parameter Description	Result	Units	Analytical Technique (Sparcode/Medium/Pres'n)
pH	7	pH units	Automated pH Meter (00041220/02/01)
Result 7.1, pH units Analyzed outside of optimal time frame.			
Residue NonFilt	8	mg/L	Grav, 9 cm Buchner, 105C (00081070/02/01)
Specific Conductance	78	uS/cm	Cond Meter Siebold (00111160/02/01)
Res. Filterable (.0u	72	mg/L	Gravimetric 1.0u Filter (007H1032/02/01)
Alkalinity total 4.5	7	mg/L	Automated Electrometer (01021210/02/01)
sult 41.1, mg/L. Analyzed outside of optimal time frame.			

Lake: FINGER

Appendix B

TRIBUTARY STREAM DATA

Lake: **FINGER**

System Name: **Unnamed C. outlet**

System No.: **25-0400-110-***-***

Site location: Sample site #1, 50 m downstream of first beaver dam on outlet. (Approximately 200 m downstream of Finger Lake).

Date:	June 13, 1990	Time:	1700 hrs
Channel Width:	40.0 m (estimate)	Water Temp.:	13.5°C
Wetted Width:	1.8 m	Stage (flow):	high
Max. Depth:	0.5 m	Velocity:	0.3 m/sec
Avg. Depth:	0.4 m	Field Gradient:	0.5%
Turbidity:	0.45 m	Colour:	tannic

Flood Signs:
Height: N/A
Type: N/A

Substrate Breakdown:

Fines	Small Gravel	Large Gravel	Cobble
100%	0%	0%	0%

Boulder	Bedrock
0%	0%

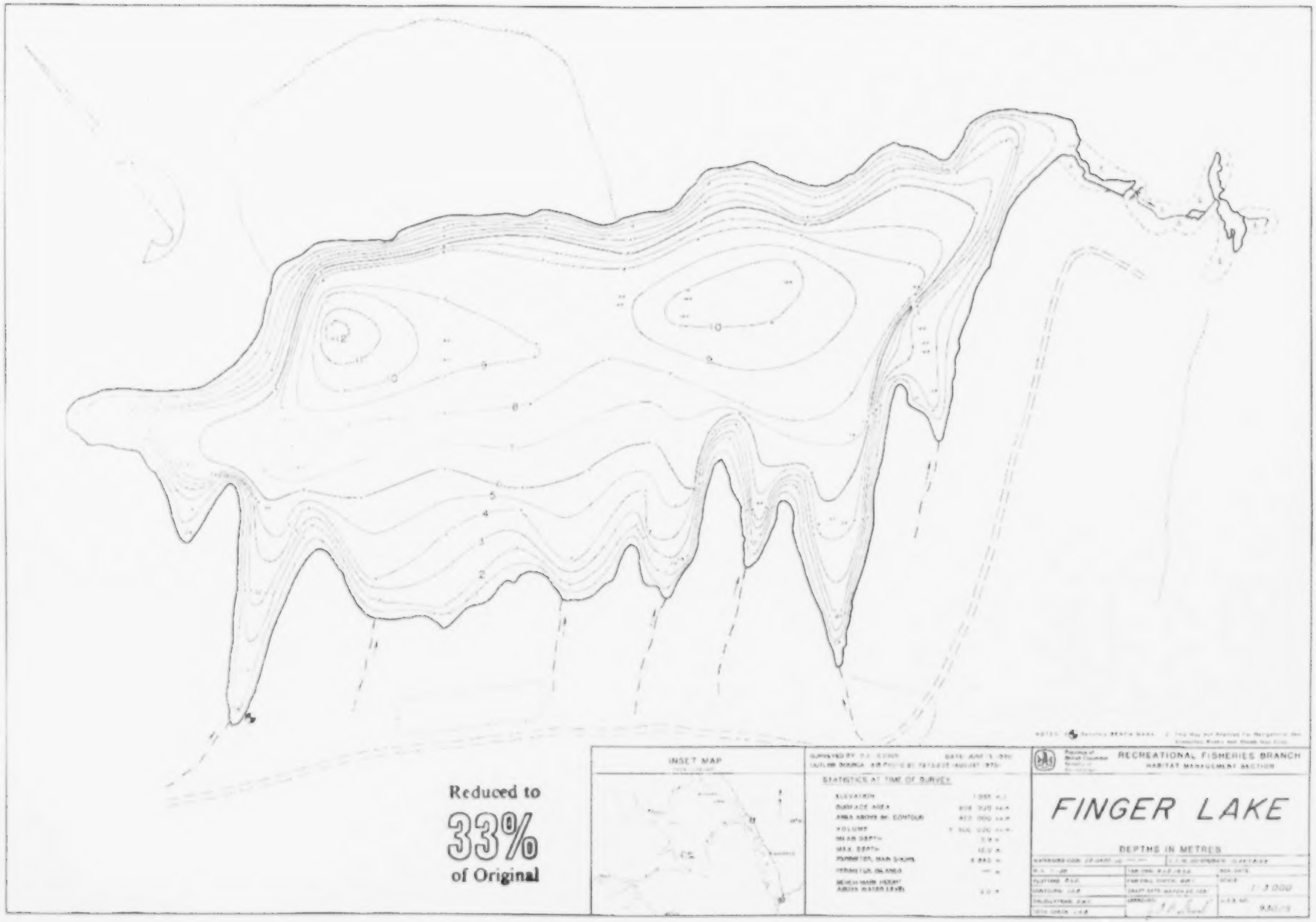
Substrate Compaction: low Sand: 0 %

Banks:

	Form	Height	Stability
Right			No defined bank.
Left			No defined bank.

Comments:

Creek meanders through organic marsh.
Flow is present, however, no salmonid spawning habitat. There is only marginal rearing habitat.
No apparent fisheries enhancement potential.



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